

BLE Module

MS52SF3

DataSheet

V 1.0.0

Applicable Product Model

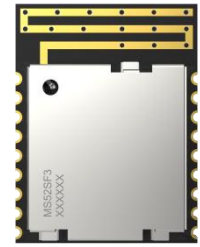
MS52SF3-N32WB031KEQ6-2

Version Note

Version	Details	Contributor(s)	Date	Notes
1.0.0	First edit	Michelle	2023.11.28	

MS52SF3-N32WB031KEQ6-2

**Ultra-low power consumption,
cost-effective Bluetooth 5.1 module with
optional external antenna support**



The MS52SF3 is a highly flexible, ultra-low power, cost-effective Bluetooth module based on the N32WB031KEQ6-2. Its powerful Arm® Cortex®-M0 CPU with a core speed of 64Mhz, 512kB FLASH program space and 48 KB SRAM memory, as well as other powerful supporting resources provide the perfect solution for Bluetooth connectivity. It supports LPUART, USART, SPI, I2C, I2S and other communication interfaces. It can be used in data transmission, smart home, Bluetooth remote control and other application scenarios.

■ Features

- Bluetooth 5.1
- High quality-price ratio
- Ultra-low power consumption
- Support optional external antenna

■ Application

- Smart home
- Smart Wearables
- Consumer electronics
- Smart healthcare
- Security equipment
- Automotive equipment
- Sports and fitness equipment
- Instrumentation

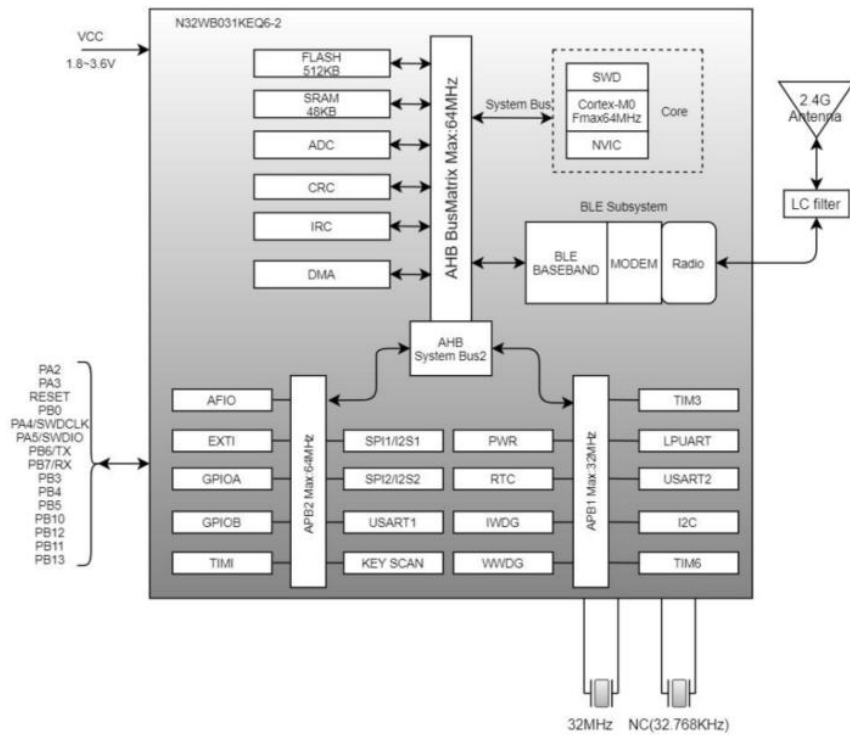
■ Key parameter

Chip Model	N32WB031KEQ6-2	Antenna	PCB
Module Size	15.8×12×2mm	GPIO	14
Flash	512KB	RAM	48KB SRAM
Receiving Sensitivity	-96dBm	Transmission Power	-20 ~ +6dBm
Current(TX)	0dBm- 4.2mA	Current(RX)	3.8mA

INDEX

1 Block Diagram	5
2 Electrical Specification	5
3 Pin Description	6
4 Pin Definition	7
5 Mechanical Drawing	8
6 Electrical Schematic	9
7 PCB Layout	10
8 Reflow and Soldering	12
9 Package Information	13
Quality	14
Contact Us	14
Copyright Statement	15

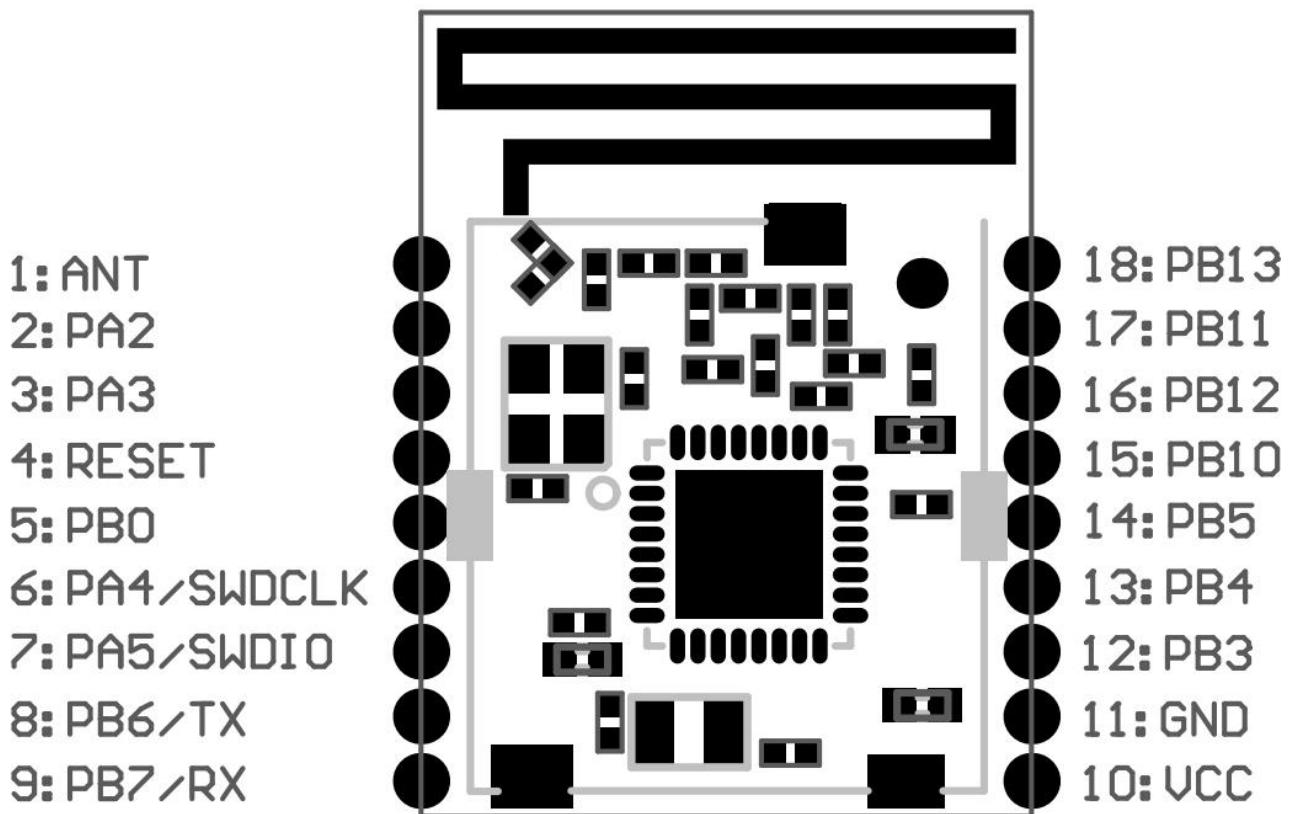
1 Block Diagram



2 Electrical Specification

Parameter	Values	Notes
Working Voltage	1.7V-3.6V	To ensure RF work, supply voltage suggest not lower than 2.3V
Working Temperature	-40°C~+85°C	Storage temperature is -40°C~+105°C
Transmission Power	-20 ~ +3dBm	Configurable
Current(RX)	3.8mA	RF receiving current under 1Mbps pattern
Current(TX)	4.2mA	RF transmission current under 0dB pattern
Module Dimension	15.8*12*2mm	
Quantity of IO Port	14	

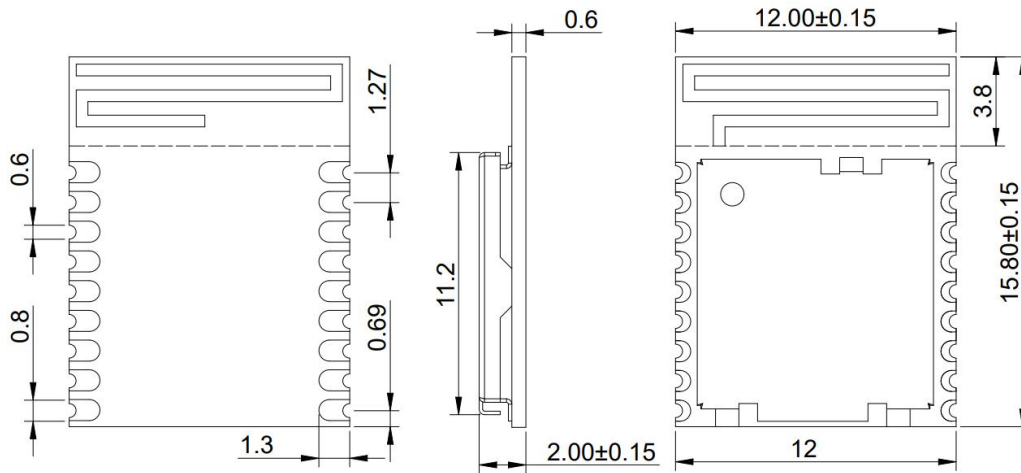
3 Pin Description



4 Pin Definition

Pin Number	Symbol	Type	Definition
1	ANT	External Antenna Pin	By default, the module comes with an antenna, this pin is directly suspended. If you don't use the module antenna, you can connect an external antenna through this pin, when connecting an external antenna, the module needs to connect the resistor with the antenna to this pin; you need to explain the configuration requirements with the salesperson.
2-3	PA2/PA3	GPIO	General Purpose IO Ports
4	RESET	Asynchronous Reset Pin	reset
5	PB0	GPIO	General Purpose IO Ports
6	PA4/SWDCLK	I/O, SWCLK	I/O pin multiplexing, burn-in pins, burn-in only need to connect the power supply pin, ground, and these two pins
7	PA5/SWDIO	I/O, SWDIO	I/O pin multiplexing, burn-in pins, burn-in only need to connect the power supply pin, ground, and these two pins
8	PB6/TX	I/O, TX	I/O Pin Multiplexing, UART TX
9	PB7/RX	I/O, RX	I/O pin multiplexing, UART RX
10	VCC	Positive Power	Power supply, 1.7V-3.6V with this pin
11	GND	Negative Power	GND
12-18	PB3/PB4/PB5/ PB10/PB12/PB 11/PB13	GPIO	General Purpose IO Ports

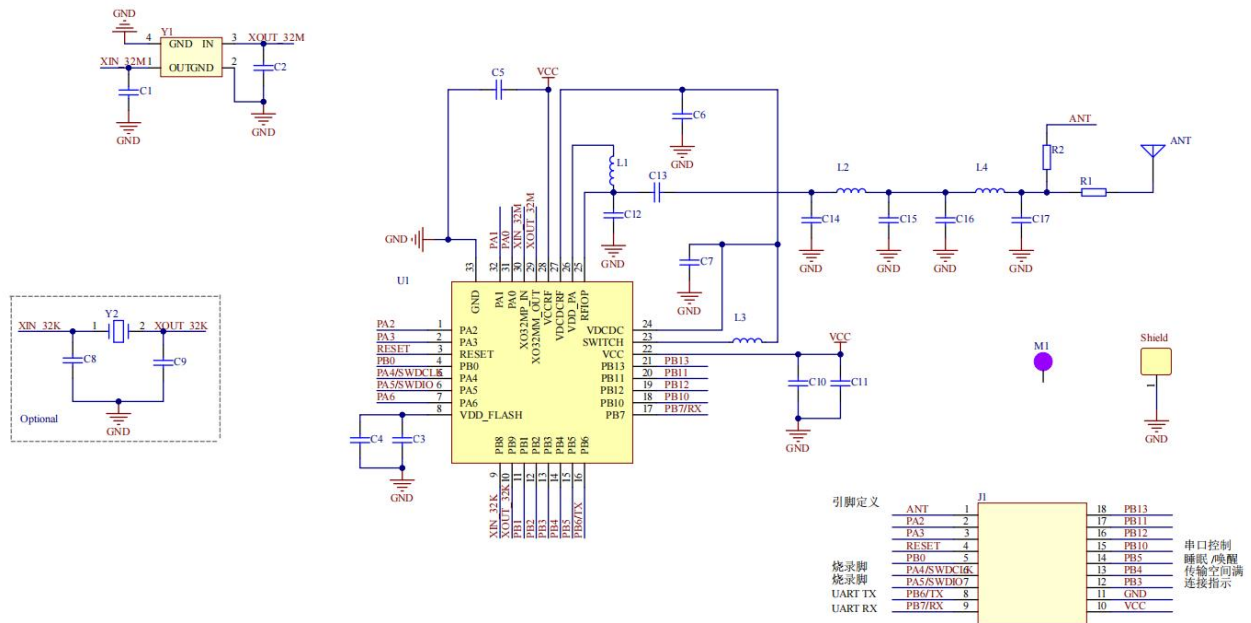
5 Mechanical Drawing



* (Default unit: mm Default tolerance: ± 0.1)

Notice: The recommended pad size is 1.8*0.8mm with a pad extension of 0.5mm

6 Electrical Schematic

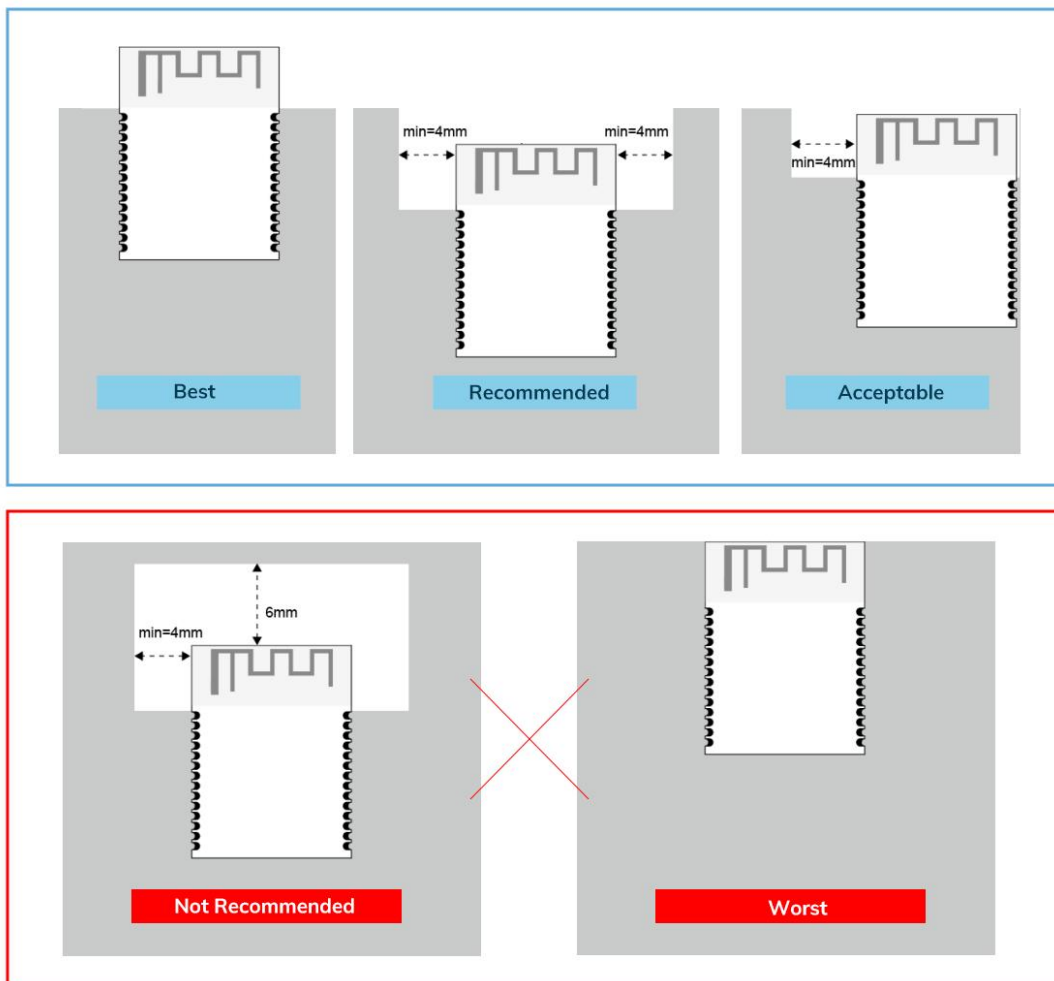


Notice: Before placing an order, please confirm the specific configuration required with the salesperson.

7 PCB Layout

Module antenna area couldn't have GND plane or metal cross line, couldn't place components nearby. It is better to make hollow out or clearance treatment or place it on the edge of PCB board.

Notice: Refer to examples as below, and highly suggest to use the first design and the adjustment of modules antenna design according to the first wiring.



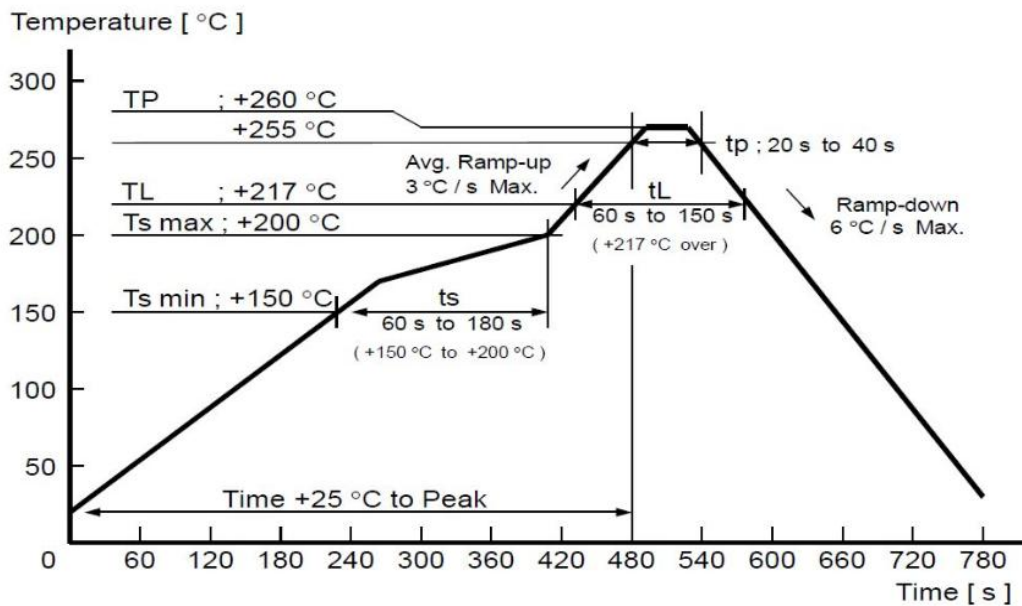
Layout notes:

- 1) Preferred Module antenna area completely clearance and not be prevented by metals, otherwise it will influence antenna's effect (as above DWG. indication).
- 2) Cover the external part of module antenna area with copper as far as possible to reduce the main board's signal cable and other disturbing.
- 3) It is preferred to have a clearance area of 4 square meter or more area around the module antenna (including the shell) to reduce the influence to antenna.
- 4) Device should be grounded well to reduce the parasitic inductance.
- 5) Do not cover copper under module's antenna in order to avoid affect signal radiation or lead to transmission distance affected.
- 6) Antenna should keep far from other circuits to prevent radiation efficiency reduction or affects the normal operation of other lines.
- 7) Module should be placed on edge of circuit board and keep a distance away from other circuits.
- 8) Suggesting to use magnetic beads to insulate module's access power supply.

8 Reflow and Soldering

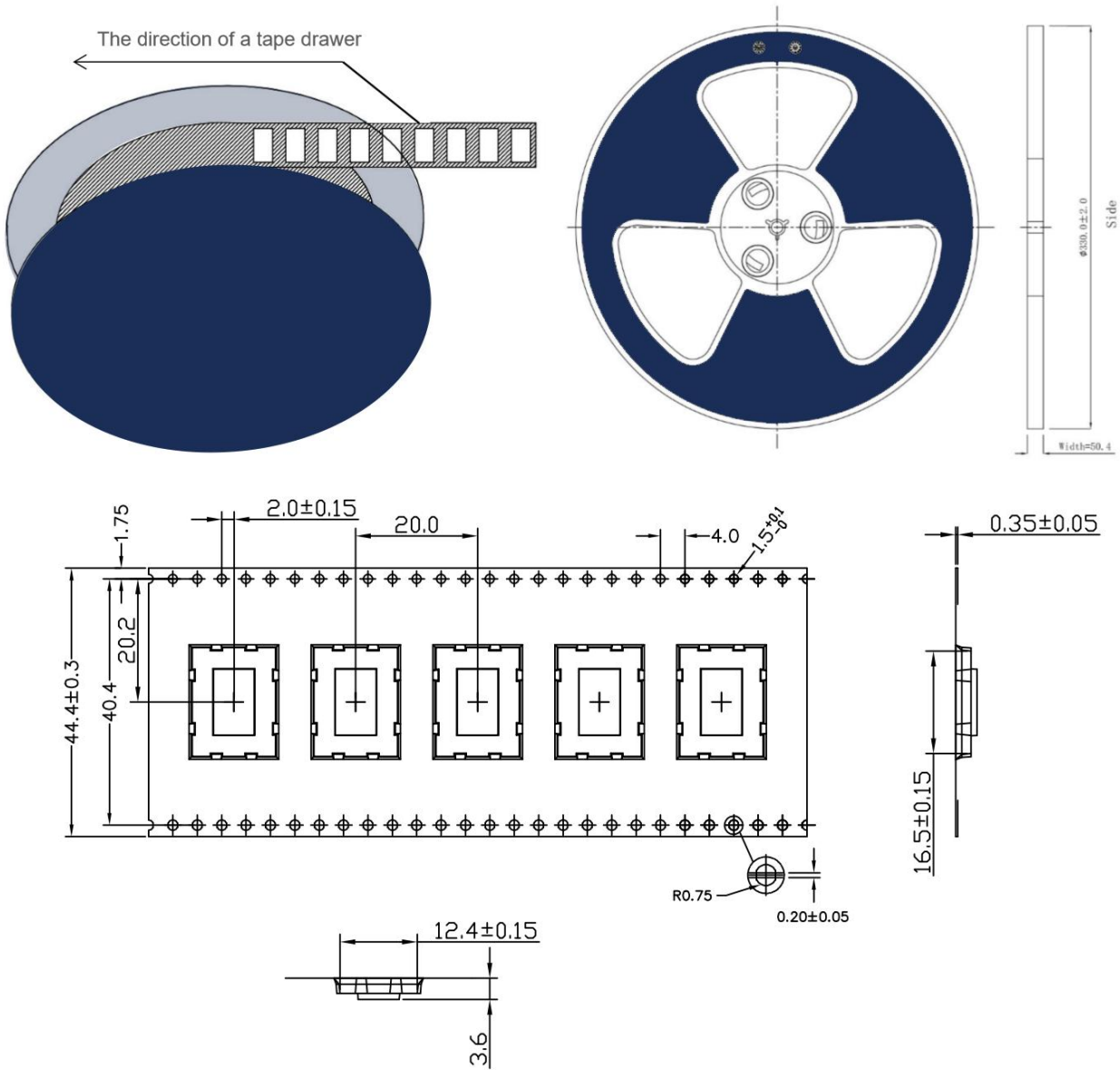
1) Do SMT according to above reflow oven temperature deal curve. Max. Temperature is 260°C;

Refer to IPC/JEDEC standard; Peak TEMP<260°C; Times: ≤2 times, suggest only do once reflow soldering on module surface in case of SMT double pad involved. Contact us if special crafts involved.



- 2) Suggesting to make 0.2mm thickness of module SMT for partial ladder steel mesh, then make the opening extend 0.8mm
- 3) After unsealing, it cannot be used up at one time, should be vacuumed for storage, couldn't be exposed in the air for long time. Please avoid getting damp and soldering-pan oxidizing. If there are 7 to 30 days interval before using online SMT, suggest to bake at 65-70 °C for 24 hours without disassembling the tape.
- 4) Before using SMT, please adopt ESD protection measure.

9 Package Information



* (Default unit: mm Default tolerance: ± 0.1)

Packing Detail	Specification	Net Weight	Gross Weight	Dimension
Quantity	850PCS	425g	1300g	W=44mm, T=0.35mm

*** Note:** Default weight tolerance all are within 10g (except the special notes)

● Quality

Cognizant of our commitment to quality, we operate our own factory equipped with state-of-the-art production facilities and a meticulous quality management system. We hold certifications for ISO9001, ISO14001, ISO27001, OHSAS18001, BSCI.

Every product undergoes stringent testing, including transmit power, sensitivity, power consumption, stability, and aging tests. Our fully automated module production line is now in full operation, boasting a production capacity in the millions, capable of meeting high-volume production demands.

● Contact Us

Shenzhen Minewsemi Co., Ltd. is committed to swiftly delivering top-quality connectivity modules to our customers. For assistance and support, please feel free to contact our relevant personnel, or contact us as follows:

Web: www.minewsemi.com

Email: minewsemi@minew.com

Linkedin: www.linkedin.com/company/minewsemi

Shop: <https://minewsemi.en.alibaba.com/>

Tel: +86 0755-28010353

Address : 3rd Floor, I Building, Gangzhilong Science Park, NO.6, Qinglong Road, Longhua District, Shenzhen, China

Click the icon to view and download the latest product documents electronically.



Related documents: Chip specification

● Copyright Statement

This manual and all the contents contained in it are owned by Shenzhen Minewsemi Co., Ltd. and are protected by Chinese laws and applicable international conventions related to copyright laws.

The certified trademarks included in this product and related documents have been licensed for use by MinewSemi. This includes but is not limited to certifications such as BQB, RoHS, REACH, CE, FCC, BQB, IC, SRRC, TELEC, WPC, RCM, WEEE, etc. The respective textual trademarks and logos belong to their respective owners. For example, the Bluetooth® textual trademark and logo are owned by Bluetooth SIG, Inc. Other trademarks and trade names are those of their respective owners. Due to the small size of the module product, the "@" symbol is omitted from the Bluetooth Primary Trademarks information in compliance with regulations.

The company has the right to change the content of this manual according to the technological development, and the revised version will not be notified otherwise. Without the written permission and authorization of the company, any individual, company, or organization shall not modify the contents of this manual or use part or all of the contents of this manual in other ways. Violators will be held accountable in accordance with the law.

MINEWSEMI

Tel: 0086-755-2801 0353

Email: minewsemi@minew.com

Web: www.minewsemi.com

Address: 3rd Floor, Building I, Gangzhilong Science Park, Qinglong Road, Longhua District, Shenzhen 518109, China

